

## CLAIMS

What is claimed is:

1. A method for authenticating a textile material, comprising:
  - selecting a unique nucleic acid marker having a specific length and a specific sequence;
  - selecting a media that causes said unique nucleic acid marker to adhere to a fibrous material;
  - mixing said media with said nucleic acid marker to generate a nucleic acid marker mixture;
  - applying said nucleic acid marker mixture to said fibrous material;
  - generating a marked fibrous material by causing said nucleic acid marker to adhere to said fibrous material;
  - producing said textile material by using one or more fibrous materials wherein one of said plurality of fibrous materials is said marked fibrous material;
  - and
  - authenticating said textile material by detecting said unique nucleic acid marker in said marked fibrous material, said nucleic acid detected with primers particular to said unique nucleic acid having said specific length and said specific sequence.

2. The method of claim 1 wherein said media is selected from a group consisting of aqueous solvents, adhesives, polymers, binders, or cross-linking agents.
3. The method of claim 1 wherein said media is selected from a group consisting of acrylic, polyurethane, dimethyloldihydroxyethyleneurea, polyvinyl alcohol, starch, epoxy, or polyvinyl chloride.
4. The method of claim 1 wherein said textile material is selected from a textile group consisting of yarns, sewing threads, fabrics, nonwoven materials, or products manufactured from fibrous materials.
5. The method of claim 4 wherein said plurality of products manufactured from fibrous materials is selected from a group consisting of apparel, home, technical, automotive, medical, aerospace, or consumer products.
6. The method of claim 1 wherein said nucleic acid is deoxyribonucleic acid.
7. The method of claim 1 wherein said nucleic acid is ribonucleic acid.
8. The method of claim 1 wherein said authenticating of said textile material further comprises identifying specific characteristics of said textile material.

9. The method of claim 8 wherein said identifying specific characteristics of said textile material further comprises determining a plurality of product information about said textile material.

10. The method of claim 9 wherein said product information is selected from a group consisting of product origin, supply chain information, or manufacturing information.

11. A method for authenticating a textile material, comprising:

selecting a unique nucleic acid marker having a specific length and a specific sequence;

selecting a media that is used as a topical treatment for a fibrous material;

mixing said media with said nucleic acid marker to generate a nucleic acid marker mixture;

applying said nucleic acid marker mixture to said fibrous material;

generating a marked fibrous material by causing said nucleic acid marker to adhere to said fibrous material;

producing said textile material by using one or more fibrous materials wherein one of said plurality of fibrous materials is said marked fibrous material; and

authenticating said textile material by detecting said unique nucleic acid marker in said marked fibrous material, said nucleic acid detected with primers particular to said unique nucleic acid having said specific length and said specific sequence.

12. The method of claim 11 wherein said media is selected from a group consisting of colorants, dyes, dyeing auxiliaries, print pastes, softeners, lubricants, antistatic agents, water repellants, moisture transport, soil resistance, antimicrobial, wetting agents, leveling agents, or water.

13. The method of claim 11 wherein said textile material is selected from a textile group consisting of yarns, sewing threads, fabrics, nonwoven materials, or products manufactured from fibrous materials.

14. The method of claim 13 wherein said plurality of products manufactured from fibrous materials is selected from a group consisting of apparel, home, technical, automotive, medical, aerospace, or consumer products.

15. The method of claim 11 wherein said nucleic acid is deoxyribonucleic acid.

16. The method of claim 11 wherein said nucleic acid is ribonucleic acid.

17. The method of claim 11 wherein said authenticating of said textile material further comprises identifying specific characteristics of said textile material.

18. The method of claim 17 wherein said identifying specific characteristics of said textile material further comprises determining a plurality of product information about said textile material.

19. The method of claim 18 wherein said product information is selected from a group consisting of product origin, supply chain information, or manufacturing information.

20. A method for authenticating a textile material, comprising:

selecting a unique nucleic acid marker having a specific length and a specific sequence;

selecting a carrier media that can be added to one or more of a plurality of fiber manufacturing processes without affecting each of said fiber manufacturing processes;

mixing said carrier media with said nucleic acid marker to generate a nucleic acid marker mixture;

applying said nucleic acid marker mixture to said fibrous material;

generating a marked fibrous material by causing said nucleic acid marker to adhere to said fibrous material;

producing said textile material by using one or more fibrous materials wherein one of said plurality of fibrous materials is said marked fibrous material; and

authenticating said textile material by detecting said unique nucleic acid marker in said marked fibrous material, said nucleic acid detected with primers particular to said unique nucleic acid having said specific length and said specific sequence.

21. The method of claim 20 wherein said textile material is selected from a textile group consisting of yarns, sewing threads, fabrics, nonwoven materials, or products manufactured from fibrous materials.

22. The method of claim 21 wherein said plurality of products manufactured from fibrous materials is selected from a group of products manufactured from fibrous materials consisting of apparel, home, technical, automotive, medical, aerospace, or consumer products.

23. The method of claim 20 wherein said nucleic acid is deoxyribonucleic acid.

24. The method of claim 20 wherein said nucleic acid is ribonucleic acid.

25. The method of claim 20 wherein said authenticating of said textile material further comprises identifying specific characteristics of said textile material.

26. The method of claim 25 wherein said identifying specific characteristics of said textile material further comprises determining a plurality of product information about said textile material.

27. The method of claim 26 wherein said product information is selected from a group consisting of product origin, supply chain information, or manufacturing information.

28. A method for authenticating a textile material, comprising:

- selecting a unique nucleic acid marker having a specific length and a specific sequence;
- selecting a viscous spinning solution for fiber-spinning;
- mixing said viscous spinning solution with said nucleic acid marker to generate a viscous dope having said unique nucleic acid marker;
- extruding said viscous dope through an opening in a spinneret to form a marked fiber;
- solidifying said marked fiber;
- producing said textile material by using one or more fibrous materials wherein one of said plurality of fibrous materials is said marked fiber; and

authenticating said textile material by detecting said unique nucleic acid marker in said marked fiber, said nucleic acid detected with primers particular to said unique nucleic acid having said specific length and said specific sequence.

29. The method of claim 28 wherein said viscous spinning solution is selected from a group consisting of acetate, rayon, acrylic, nylon, polyester, or glass.

30. The method of claim 28 wherein said textile material is selected from a textile group consisting of yarns, sewing threads, fabrics, nonwoven materials, or products manufactured from fibrous materials.

31. The method of claim 30 wherein said plurality of products manufactured from fibrous materials is selected from a group consisting of apparel, home, technical, automotive, medical, aerospace, or consumer products.

32. The method of claim 30 wherein said nucleic acid is deoxyribonucleic acid.

33. The method of claim 30 wherein said nucleic acid is ribonucleic acid.

34. The method of claim 30 wherein said authenticating of said textile material further comprises identifying specific characteristics of said textile material.



35. The method of claim 34 wherein said identifying specific characteristics of said textile material further comprises determining a plurality of product information about said textile material.

36. The method of claim 35 wherein said product information is selected from a group consisting of product origin, supply chain information, or manufacturing information.

37. A method for manufacturing a marked textile to authenticate said marked textile's origin, comprising:

providing at least one nucleic acid marker;

mixing said at least one nucleic acid marker with a liquid;

spraying said liquid on a first fiber so as to mark said first fiber with nucleic acid; and

combining said marked first fiber with one or more unmarked fibers to generate said marked textile.

38. The method of claim 37 wherein said spraying of said liquid is performed during a bale opening process.

39. The method of claim 37 wherein said spraying of said liquid is performed during a knitting/weaving process.

40. The method of claim 37 wherein said liquid includes an ink that is used during a dyeing process.

41. The method of claim 37 wherein after combining said marked first fiber with one or more unmarked fibers, the method further comprises processing said marked textile using typical textile processes.

42. The method of claim 37 wherein said first fiber comprises rayon.

43. The method of claim 37 wherein said first fiber is configured to adhere to said at least one nucleic acid marker.

44. The method of claim 37 further comprising mixing said liquid in a dyeing process.

45. A method for manufacturing a marked textile to authenticate said marked textile's origin, comprising:

providing at least one nucleic acid marker;

providing an infrared marker;

embedding said at least one nucleic acid marker and said infrared marker into a first fiber so as to mark said first fiber;

blending said marked first fiber with one or more unmarked fibers to generate said marked textile.

46. The method of claim 45 wherein said blending of said marked first fiber with one or more unmarked fibers is performed during ginning.

47. The method of claim 45 wherein said blending of said marked first fiber with one or more unmarked fibers is performed before opening of a yarn manufacturing process.

48. The method of claim 45 wherein said blending of said marked first fiber with one or more unmarked fibers is performed during opening of a yarn manufacturing process.

49. The method of claim 45 wherein said blending of said marked first fiber with one or more unmarked fibers is performed before blending of a yarn manufacturing process.

50. The method of claim 45 wherein said blending of said marked first fiber with one or more unmarked fibers is performed during blending of a yarn manufacturing process.

51. The method of claim 45 wherein said first fiber comprises rayon.
52. The method of claim 45 wherein said first fiber is configured to adhere to said at least one nucleic marker.
53. The method of claim 45 further comprising mixing said at least one nucleic markers in a dyeing process for yarn manufacturing.